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XV.—*On the British Species of Alpheus, Typton, and Axius, and on Alpheus Edwardsii of Audouin.* By the Rev. A. M. NORMAN, M.A.

IN the 'Annals' of the present month Mr. Spence Bate records and figures two Macrourous Crustacea as new to our fauna, under the names of "*Alpheus Edwardsii*" and "*Typton spongiosus*." The former species, however, is so far from being hitherto unknown in our seas, that this is the *third* time that it has been announced as a new discovery; and the Crustacean here called *Typton spongiosus* was described and figured by Mr. Couch, in 1861, as "*Alpheus Edwardsii*." It seems strange that Mr. Bate should not have known this, as the species was found in his own neighbourhood, and, moreover, Mr. Couch is one of the members of the Devon and Cornwall Dredging Committee.

I should not, however, have considered it necessary to notice this, if it had not been that the greatest confusion exists as to what "*Alpheus Edwardsii*" is, on which account it seems desirable to make a few observations upon the genera *Alpheus* and *Typton*.

Savigny, in his 'Histoire de l'Egypte,' admirably figured a Crustacean, to which Audouin, in the descriptive portion of that work, gave the name "*Athanas Edwardsii*." Milne-Edwards, in his 'Hist. Nat. des Crustacés,' described a Mediterranean form which he erroneously considered to be Audouin's species. Lastly, Mr. Couch (Proc. Linn. Soc., 1860, Zoology, v. p. 210) described a Cornish Crustacean under the same name; but his species is neither that of Audouin nor that of Milne-Edwards, but the *Typton spongicola* of Costa. The name of *Alpheus Edwardsii* has thus been given to no less than three distinct species, two of which, as we shall presently see, occur in our seas, though the true *Alpheus Edwardsii* of Audouin is not European.

As long ago as 1835, Mr. Hailstone procured off Hastings a shrimp, which he figured and described in 'Loudon's Magazine of Natural History,' and to which Mr. Westwood gave the name of *Hippolyte rubra*; in a subsequent page, Mr. Hailstone claimed a right to name it himself, and styled it *Hippolyte megacheles*; and further on in the same volume, Mr. Westwood established a genus for its reception, calling it *Dienecia rubra*. Why Prof. Bell omitted this species in his 'History of British Stalk-Eyed Crustacea,' I cannot understand. In 1854, Mr. Guise, having found the same species in the island of Herm, described it in the 'Annals,' and named it "*Alpheus affinis*." In 1862 Prof. Heller pointed out the distinction between the Red-Sea species (*Alpheus Edwardsii*, Aud.) and that found in the Mediterranean (*Alpheus Edwardsii*, Milne-Edwards), and named the latter *Alpheus platyrhynchus*. The *Alpheus* now found by Mr. Bate off the Dodman is the Mediterranean species, and the same which had been previously taken in our seas by Hailstone and by Guise. As I write, thirty or forty specimens of this *Alpheus*, procured by me at Herm, are before me, and also a specimen of the true *Alpheus Edwardsii* of Audouin, for which I am indebted to Prof. Heller. From these examples I draw up the diagnostic characters which follow.

Alpheus Edwardsii, Audouin.

1826. *Athanas Edwardsii*, Audouin, Savigny, Descript. de l'Egypte, pl. x. fig. 1 (figures admirable).
 1840 (? about), *Alpheus Edwardsii*, Guérin, Iconogr. du Règne Anim. Crust. pl. 21. fig. 3 (copy from Savigny).
 1861. *Alpheus Edwardsii*, Heller*, Sitzungsab. d. k. Akad. d. W. Math.-nat. Cl. xlv. Bd. i. p. 267.

Supraorbital portions of anterior margin of carapace rounded, the front thus furnished with only a single central point, *i. e.* the rostrum. The left first pereopod much larger, and of totally different structure from the right; outer side of hand (not furnished with any spine-like central point projecting at the junction of finger and thumb) having a deep incised curved groove widest at the distal extremity, suddenly contracting in breadth towards the base, and at the same time curving downwards; finger large, very broad and massive, the outer margin very strongly arched, forming a complete semicircle; inner margin furnished at the base with a large tubercular process, which fits into a corresponding socket in the thumb. Right hand very much smaller, and formed more after the pattern of the hand in

* Beiträge zur Crustaceen-Fauna des rothen Meeres.

Palæmon. The fingers of both hands articulating by a vertical movement with the hand.

Hab. The Red Sea.

Alpheus megacheles, Hailstone.

1835. *Hippolyte rubra*, Westwood, Loudon's Mag. Nat. Hist. vol. viii. p. 272 (but not *Alpheus ruber*, M.-Edw.).
1835. *Hippolyte megacheles*, Hailstone, *ibid.* p. 395.
1835. *Dieneeia rubra*, Westwood, *ibid.* p. 552.
1837. *Alpheus Edwardsii*, Milne-Edwards, Hist. Nat. des Crust. vol. ii. p. 352 (but not of Audouin).
1846. *Cryptopthalmus ruber*, Costa, Fauna del Regno di Napoli, Crust. pl. 7. fig. 1.
1850. *Dieneeia rubra*, White, Cat. Brit. Crust. in Brit. Mus. p. 41.
1854. *Alpheus affinis*, Guise, Ann. Nat. Hist. ser. 2. vol. xiv. p. 275.
1857. *Alpheus affinis*, White, Pop. Hist. Brit. Crust. p. 112.
1862. *Alpheus platyrhynchus*, Heller*, Sitzungsber. der Kais. Wiener Akad. d. W. Math.-naturw. Cl. xl. Bd. i. p. 400, pl. 1. figs. 21-24.
1863. *Alpheus platyrhynchus*, Heller, Die Crust. des südlichen Europa, p. 276, pl. 9. figs. 18, 19.
1868. *Alpheus Edwardsii*, Bate, Brit. Assoc. Rep. (1867), p. 283; Ann. Nat. Hist. ser. 4. vol. ii. p. 119.

Supraorbital portions of carapace produced into spine-like points; and these, together with the rostrum, give a tridentate anterior margin to the carapace. The right and left first pereiopods formed on nearly the same model, though differing in minute details, one (generally the left) larger than the other, and having the centre of its broad outer side produced forwards between the finger and thumb into a spine, above and below which the hand is excavated, the upper groove the larger, not curved; finger very flat, acute above, twisted, no tubercle on the inner margin. Smaller hand having that part of the thumb against which the finger impinges grooved; upper margins of both finger and thumb fringed with long setæ; inner margin of finger microscopically pectinated. Fingers of both hands articulating by a curious lateral movement.

Hab. Herm (Guise & A. M. N.), Jersey (A. M. N.), Hastings (Hailstone), off Dodman (Bate), Mediterranean (Milne-Edwards), Adriatic (Heller).

Alpheus ruber, Milne-Edwards.

- ?1814. *Cryptopthalmus ruber*, Rafinesque, Précis des découvertes somiologiques, &c.
?1825. *Cryptopthalmus ruber*, Desmarest, Consid. gén. sur Crust. p. 215.
1837. *Alpheus ruber*, M.-Edwards, Hist. Nat. des Crust. vol. ii. p. 351, and Atlas du Règne Animal de Cuvier, édit. trois., Crust. pl. 53. fig. 1.
1840. *Alpheus ruber*, Lucas, Hist. Nat. des Crust. p. 182.

* Beiträge zur näheren Kenntniss der Macrouren.

1849. *Alpheus ruber*, Bell, Brit. Stalk-eyed Crust. p. 271.

1850. *Alpheus ruber*, White, Cat. Brit. Crust. in Brit. Mus. p. 38; and (1857) Pop. Hist. Brit. Crust. p. 112, pl. 8. fig. 3.

1863. *Alpheus ruber*, Heller, Crust. des südlichen Europa, 274.

This species may at once be distinguished from the preceding by the four longitudinal carinæ of the larger and greatly flattened hand.

Three Cornish specimens of this species in my collection have the right hand the greatly developed organ; while a Mediterranean example and also that figured by Bell have the left the larger.

The description of *Cryptophtalmus ruber* of Rafinesque and Desmarest appears to be partly applicable to the last species and partly to this. The words, however, "la plus grande" (main) "est à trois angles en dessous" cannot possibly be reconciled with *A. megacheles*, though they may be with *A. ruber*, if what Milne-Edwards speaks of as the outer side be viewed as the under. The *Cryptophtalmus ruber* of Costa is unquestionably a synonym of the last species, and not of this.

Hab. Falmouth (Cocks), Polperro (Laughrin), Mediterranean (Milne-Edwards & Costa), Adriatic (Grube), Algerian coast (Lucas).

Typton spongicola, Costa.

1846. *Typton spongicola*, Costa, Fauna del Regno di Napoli, Crust. pl. 6 bis. figs. 1-6.

1856. *Pontonella glabra*, Heller*, Verhandlungen des zool.-botan. Vereins in Wien p. 629, pl. 9. figs. 1-15.

1861. *Alpheus Edwardsii*, Couch, Proc. Linn. Soc., Zoology, vol. v. p. 210 (but not *Alpheus Edwardsii* of Audouin, nor that of Milne-Edwards).

1863. *Typton spongicola*, Heller, Crustaceen des südlichen Europa, p. 254, pl. 8. figs. 12-17.

1868. *Typton spongiosus*, Bate, Brit. Assoc. Rep. (1867) p. 283, pl. 3. fig. 1; and Ann. Nat. Hist. ser. 4. vol. ii. p. 119.

The genus *Typton* differs from *Alpheus* in having the eyes free, and not concealed beneath the anterior portion of the carapace, in the second instead of the first pair of pereopods being the more largely developed members, and in the mandible being without an appendage, whereas in *Alpheus* it is furnished with a two-jointed palp.

Seven or eight years ago, Mr. Laughrin, the intelligent coastguardsman of Polperro, found within the oscula of *Iso-dictya palmata*, procured off that coast, some shrimps. Mr. Couch gave an account of these in the Proc. Linn. Soc., naming them *Alpheus Edwardsii*, M.-Edw. One of these specimens came into my hands; and having compared it with a specimen of *Typton spongicola* from the Adriatic, I found

* Beitrag zur Fauna der Adria.

them to agree in every particular. Mr. Spence Bate considers a species he has now met with to be distinct from that of Costa, and names it *Typton spongiosus*; but no character is given which will distinguish it from the Adriatic and Mediterranean form. The proportionate length of the eye and rostrum differs in different specimens, possibly according to age. In his *generic* characters, Mr. Bate says that the right hand of the second pereopoda is generally much larger than the left; but the contrary would seem to be the case from the descriptions and figures of both Costa and Heller, and from the Adriatic and British examples in my own collection. In the genus *Alpheus*, however, we have seen that the rule is not constant, and that in the same species sometimes the one and sometimes the other limb will be the larger in size, and have the peculiar points of structure of that organ as distinguished from the smaller. It must, in addition to this, be borne in mind that in this and allied species the animals upon the slightest provocation are willing to part with their large claws, and that consequently reproduced members of smaller size are not uncommon, and may easily be mistaken for fully developed limbs.

Hab. Polperro, Cornwall (Laughrin), Mediterranean (Costa), Adriatic (Grube & Heller).

Genus AXIUS.

I have not examined the typical specimen of *Axius styrinchus*; but all the examples of *Axius* I have seen agree closely with the description, referred to by Mr. Bate, of the late Mr. R. Q. Couch (Zoologist, 1856, p. 5282) of a form which he considered distinct from Leach's species. My collection contains five specimens procured by Mr. Dodd in Jersey, and one taken by the Rev. R. N. Dennis, at Seaford, Sussex. All these have the telson quadrangular, the hands smooth, the fingers channelled, the particular articulation of cephalothorax and abdomen described by Mr. Couch, and the transverse lateral tufts of hair on the abdominal segments. All the points of difference indicated are probably at the most sexual. My specimens are in spirits: it is not improbable that, in drying, the sides of the telson would curl downwards; and thus that portion of the body might easily assume the "elongate-triangular" form ascribed to it by Leach and Bell. At least we require further knowledge before it would be wise to give a distinctive name to the form in the collections of the late Mr. R. Q. Couch and myself. The young in this genus are much more hirsute than full-grown individuals.

Crangon sculptus and *fasciatus*.

I am surprised at Mr. Bate's suggestion that *Crangon sculptus* and *Crangon fasciatus* are the same species. In my humble judgment, no two Crangons belonging to the same section of the genus can have stronger distinctive features. Can it be that Mr. Bate has not met with the true *C. fasciatus*? The differences are not confined to the number of spines: there are other characters; and of far more consequence is the fact that, whereas in *C. sculptus* the abdomen is elaborately ornamented with beautiful sculpturing, in *C. fasciatus* it is quite smooth. Dr. Kinahan's figures and description of this latter species are very good (Trans. Royal Irish Acad. vol. xxiv. (1861) p. 76; and Proc. Royal Irish Acad. 1862, p. 362, pl. 12). *Crangon nanus*, Kröyer (= *C. bispinosus* of Hailstone) appears to me to be the species most closely related to *C. fasciatus**.

P.S. As though to confirm what I have just said—among some shrimps dredged during the past month in Shetland by Mr. Jeffreys, and received from him this morning, I find several *C. fasciatus*, but there are no *C. sculptus*; nor is that species known to inhabit the Shetland seas. I have never found these two species in company, nor seen a specimen intermediate in character. *Crangon fasciatus* I have dredged off the Northumberland coast (where *C. sculptus* has not been found at all), at Falmouth, and off Guernsey; and *C. sculptus* I have procured in the Minch, Lamash Bay, and Guernsey.

XVI.—*Contributions to the Study of the Entomostraca.*

By GEORGE STEWARDSON BRADY, C.M.Z.S. &c.

No. II. *Marine Ostracoda from the Mauritius.*

[Plates XII. & XIII.]

THE species here described have been found in mud brought from the Mauritius, and kindly placed in my hands by my friends Messrs. Thomas Blain and E. C. Davison, of Sunderland. It is interesting to note that two of the species, *Cythere Darwinii* and *C. Hodgii*, occur also in the Malay archipelago, and that the specimens from the Mauritius exhibit slight, but decided differences; while *Macrocypris maculata*, *Xestoleberis margaritea*, and *Cytheridea punctillata* have a still wider range

* Judging from Kröyer's figures of *C. boreas*, Phipps, in the 'Naturhistorisk Tidsskrift,' vol. iv. (1842) p. 218, pl. iv. figs. 1-14, I should conclude that it is distinct from all our British species.